

COVID-19: Guidance for infection prevention and control in nuclear medicine settings

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Bearing in mind the rapid speed with which the situation is changing, this guidance should be read in conjunction with current government and your local Trust advice.

The number of people contracting Covid-19 is likely to increase to significant levels in the coming months, and especially over the next four weeks. Staffing numbers in nuclear medicine are small compared to other modalities, and therefore absences can have a significant effect. Services being provided / planned must be proportionate to staffing levels. Once staffing levels fall below a key threshold, some services could be curtailed in order to prioritise services for urgent patients including cancer patients.

Please ensure that supplies of radiopharmaceuticals are being maintained and look out for notices from manufacturers/ local Radiopharmacies on supply constraints. This may guide the range and breadth of services being provided.

Patients:

Lost appointments: Many outpatient appointments will be lost due to patients not being able to attend, either because:

- They could be unwell with suspected coronavirus (or have the symptoms) and are self-isolating at home.
- One of their dependants are sick and they must remain at home to care for them.
- They have been told to self-isolate due to certain conditions (e.g. their age)

It is recommended that lists of patients awaiting scans be reviewed on a daily basis and known lost appointments should be factored in when drawing up the workplan for each day. If a procedure can be deferred for 3 to 6 months without undue delay in prognosis, this patient/procedure could be postponed in favour of freeing up capacity for urgent patients on limited staffing.

It may not always be known in advance that a patient cannot attend, and it is likely there will be an increase in DNA's. It is advised that departments contact patients by phone the day before to check their symptoms and to ask if they are still planning to attend.

Look at patient wait areas try to ensure these do not get crowded ask patients coming to cold wait not to arrive more than 5 minutes before their appointment. Maximum of one person to come with them, adult only. Keep hot wait for those who cannot physically leave the department. All patient wait areas should be wiped down with appropriate sanitiser at least every 2 hours.

Priority appointments: As it becomes increasingly necessary to prioritise patients, some tests will have to be rebooked. Those for chronic conditions have lower priority compared to acute/severe

conditions and a traffic light system is proposed in **Appendix 1** to assist with the decision making process:

- Tests in green category can be cancelled/rebooked as and when needed.
- Amber appointments must be discussed with a clinician beforehand if considering cancelling/rebooking
- Red appointments must not be cancelled as they are deemed essential, unless under extreme circumstances.

Expensive tests: Where possible delay these tests until this crisis is over if expensive radiopharmaceuticals are bought in, appointments should be reviewed before booking to avoid expensive DNA's, and it should be confirmed that the product can still be supplied as there may be some disruption to this.

Patient hand hygiene: Patients should be asked to clean their hands when they arrive and before they come in to the scanning rooms, preferably by handwashing, although alcohol gel can also be used. Signage is helpful with this.

Staff Hand hygiene: Staff should clean their hands at regular intervals during the day for 20 seconds each time using soap and running water. Ideally gloves should be worn when handling patients, for example, when helping them on and off the bed. These must be changed between each patient contact. If not wearing gloves, staff should wash hands before / after every patient. Hand moisturisers should be used to ensure the skin does not become affected by repeated washing. Avoid touching face with hands.

Symptomatic patients: Any patient showing symptoms of the virus (fever, or persistent dry cough) should be sent home, and the procedure rebooked, even if they are attending for a high priority (red) procedure, or even if they have been injected with the radiopharmaceutical.

PPE: Example guidance on what PPE to wear in nuclear medicine and when to wear it is given in **Appendix 4** and supplies may have to be centralised. PPE should be kept in all injection rooms (i.e. more than one location) in case of inaccessibility due to radioactive contamination. Different PPE may need to be worn outside of Nuclear Medicine, for example, on the ward. Follow Local Trust Policies for this. Regular stock takes should be made to ensure there will be no shortage.

Equipment:

- If possible, one camera should be set aside for non-symptomatic patients only (out or inpatients) with a different camera being reserved for symptomatic/unconfirmed/confirmed patients.
- *Cleaning & Decontamination:* camera rooms should be cleaned down after each patient and surfaces such as couch, chairs wiped down with a sanicloth or equivalent. After a symptomatic / confirmed Covid-19 patient camera doors should be left open for 20mins to allow for air re-circulations.
- Symptomatic/unconfirmed/confirmed Covid-19 patients should be brought immediately into the camera room and not left waiting anywhere else.

- The ideal time to perform scans of infectious patients is in the afternoon to minimise cross contamination after use. However, in the afternoon, you will end up injecting more particles of MMA. Also, the Kr generator will be weaker. So morning appointments are preferred.

Precautions for Lung Imaging:

VQ Scan for known Covid-19 patients

- Most in-patient referrals are for VQ scans and these could include suspected or confirmed in-patient Covid-19 positive patients. **Please consider all patients as potentially COVID-19 positive and wear appropriate PPE.**
- When performing a VQ scan on these suspected or confirmed Covid-19 patients, the NM operator of choice would be those with no other medical conditions.
- Government guidance is available on how to minimise spread of infection:
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872745/Infection_prevention_and_control_guidance_for_pandemic_coronavirus.pdf
- From this guidance, the VQ scan may not be considered an actual aerosol. However, given the patient's likely symptoms (cough), the test warrants extra PPE as per **appendix 4**. The operator (injector, and mask fitter) should wear the full PPE – gloves, FFP3 mask, visor, and gown as there is a time during this test when the operator must be in close contact with the patient's mouth in order to fit the aerosol mask.
- **Only perform ventilation at the same time if you have Krypton-81m available.** The use of a perfusion only scan is unlikely to be of any benefit – the Coronavirus response PROBABLY alters MAA distribution. In other words, it is unlikely for a perfusion only study to be normal. If using Krypton, proceed with a dual energy Tc-MAA/Kr-gas VQ to complete the test quickly.
- Other ventilation agents may not be suitable due to the time required to be with the patient, and the unsatisfactory distribution due to likely patient non-compliance. If Technegas or aerosol is used there is a small but definite risk of contamination. In this case perform the perfusion first and only do ventilation if really required. This may need to be next day.
- For non-pregnant patients, consider increasing the DRL from 200MBq to 300MBq to bring about rapid SPECT imaging (5mins cp 12 mins). It would also reduce the time the patient and accompanying ward staff are in the department. Note: all referrals must be vetted by the ARSAC licence holder in this case as it MAY involve an increased DRL.
- Patients with pulmonary hypertension should only receive 200MBq and always injected in the morning.
- If more than one referral is made, these should be booked and performed consecutively, allowing for the 20min air circulation.
- For all other VQ scans (i.e. those non-symptomatic for Covid-19), whether in-patient or outpatient, the operator should wear a surgical mask, gloves and gown.
- Use disposable tourniquets and any disposable waste from the procedure should be bagged in suitable waste bags (details to be confirmed)
- A proposed plan for VQs can be found in appendix 5.

Reporting Nuclear Medicine and MDTs:

- Once scans are being/ have been performed, remote reporting options could be explored in conjunction with radiology/PACS/IT teams.

- Participation in MDTs can be limited in line with national guidance, please ensure ability to dial in remotely and rotation of staff attending MDTs

PET-CT:

- We expect that demand for PET-CT may reduce a little with less “follow up” scans but generally there will still be a significant work load. If you have separate uptake rooms not being used for PET, consider using these areas for “at risk” patients from the rest of imaging.
- Be prepared to use any spare CT capacity on the machine for acute chest CTs as throughout put on CT scanners may be reduced by need to clean room between patients
- We advise reviewing the CT component of PET-CT on lung windows to check that patients do not have incidental signs of Covid-19 before they leave the scanner. If there are signs the scanner needs to be decontaminated prior to the next patient. Please see information on the BSTI website for CT appearances: <https://www.bsti.org.uk/covid-19-resources/>.

SPECT-CT:

- We advise reviewing the CT component of SPECT-CT on lung windows to check that patients do not have incidental signs of Covid-19 before they leave the scanner. If there are signs the scanner needs to be decontaminated prior to the next patient. Please see information on the BSTI website for CT appearances: <https://www.bsti.org.uk/covid-19-resources/>.

Therapeutic Nuclear Medicine:

- Each patient needs to be assessed on an individual basis.
- Radioiodine therapy appointments for benign Hyperthyroidism may have to cease, since they are in the main, non-urgent, and would pose radiation protection issues should they be admitted to ITU. However, consideration should be given to giving the treatment to those patients who are unable to tolerate anti-thyroid medications, or those who have other severe comorbid issues, whereby a delay in treatment would cause more harm than good.
- Administration of radioiodine ablation therapy to Thyroid cancer patients needs careful consideration. Please follow the RCR Thyroid Cancer guidance for actions to be taken for low, medium and high risk patients in terms of delay of treatment and measures to be taken should the decision be made to go ahead with treatment.
- Lutathera for patients with low and medium grade Neuroendocrine tumours could proceed as a routine out-patient procedure, although this may need review of local risk assessments/guidelines. However, since these patients could be considered as at risk due to possible marrow depletion post procedure, it may be safer to defer treatment for a few months. Each patient should be reviewed in their own clinical and local contexts.
- Radium-223 dichloride can be administered as an outpatient procedure, provided the patients do not have comorbidities that would put them at high risk due to low immunity. Please review each patient in their own clinical and local contexts.

Appendix 1 – test priorities for cancelling/rebooking purposes in the event of a stretched service

Please refer to the table below when dealing with appointments during times when the service is stretched.

Remember to always liaise with Radiopharmacy when changing appointments

Red	Amber	Green
Do not cancel or rebook unless patient at risk	Discuss with clinician if there is a need to cancel/rebook	cancel or rebook as necessary, without need for discussion with a clinician
Oncology Bones	2 phase bones and non-oncology Whole body bone	Morphine HIDA
Meckels	MPS routine	Sincalide HIDA
GI bleed	TI-201 hibernation	C13 UBT
GFR	White cell consider FDG	CSF studies
SLN	Platelet	Dacrosintigraphy
Y90-SIRT	Lung VQ	Salivary
Lung perfusion	MIBG heart	Gastric Emptying
MPS acute chest pain	MIBG pheochromocytoma	Small bowel transit
Radium-223	MUGA	Lymphoscintigraphy
Lu-177 DOTATATE	Amyloid DPD	Proctoscintigraphy
F-18 FDG new cancer	Parathyroid	Red Cell Mass
F-18 FDG sepsis	Mag3	SeHCAT
	DMSA	Colonic Transit
	Octreotide/Tektrotyd	DATscan
	Thyroid Tc-99m/ I-123	
	Parathyroid	
	Ga-68 DOTATATE	
	Ga-68 PSMA	
	F-18 FDG follow up	



HM Government



CORONAVIRUS

If you have been to an affected place
in the last 14 days

or

had contact with somebody
with Coronavirus,

and

do you have any of these symptoms?



Cough



Fever



Shortness of
breath

If yes, to protect yourself and others please
go home and search 'nhs coronavirus'
for advice and to access the 111 online
coronavirus service or call NHS 111.

Find out more at [gov.uk/coronavirus](https://www.gov.uk/coronavirus)

Appendix 3: Coronavirus symptoms compared with flu and the common cold

Symptoms	Coronavirus Symptoms range from mild to severe	Cold Gradual onset of symptoms	Flu Abrupt onset of symptoms
 Fever	Common	Rare	Common
 Fatigue	Sometimes	Sometimes	Common
 Cough	Common* (usually dry)	Mild	Common* (usually dry)
 Sneezing	No	Common	No
 Aches and pains	Sometimes	Common	Common
 Runny or stuffy nose	Rare	Common	Sometimes
 Sore throat	Sometimes	Common	Sometimes
 Diarrhea	Rare	No	Sometimes for children
 Headaches	Sometimes	Rare	Common
 Shortness of breath	Sometimes	No	No

Sources: World Health Organization, Centers for Disease Control and Prevention

Appendix 4 – Suggested PPE Guidance

<i>Patient type</i>	<i>Change in guidance</i>
For symptomatic, unconfirmed in-patients meeting the COVID19 case definition	Operators must wear : <ul style="list-style-type: none"> - Regular surgical mask - gloves - apron - strict hand hygiene
For confirmed cases of COVID-19	Operators must wear full PPE: <ul style="list-style-type: none"> - FFP3 mask or respirator hood - disposable eye protection , preferably visor - long sleeved gown - gloves. - Scrubs - Strict hand hygiene
For possible and confirmed cases of COVID-19 requiring an aerosol generating procedure	Full PPE ensemble as per previous guidance for confirmed cases: FFP3 respirator, disposable eye protection, preferably visor, long sleeved disposable gown and gloves.

Appendix 5

